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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/644,068	08/23/2000	Takeshi Shibuya	500.38902X00	1492
20457	7590	05/05/2004	EXAMINER	
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-9889			LEE, TOMMY D	
			ART UNIT	PAPER NUMBER
			2624	

DATE MAILED: 05/05/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/644,068

Applicant(s)

SHIBUYA ET AL.

Examiner

Thomas D. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-3,7 and 8 is/are allowed.
- 6) ☒ Claim(s) 4-6,9 and 10 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 4-6, 9 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The last paragraph of claim 4 recites, "[s]aid PWM tone value (p) depends only on a difference ($\Delta n = n_i - n_c$) between said input tone value (n_i) and said threshold value (n_c), and simultaneously, said address offset value (p_0) is switched on the basis of a comparison of said threshold value (n_c) with said threshold value (Θ) or a comparison of said tone value (n_i) of said input pixel with said threshold value (Θ)." (italics added) It is not clear as to what action is being performed simultaneously with the switching of the address offset value. The part of the paragraph not italicized merely defines the PWM

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value, while the part of the paragraph italicized, after "simultaneously," recites an action being undertaken. The last paragraph, as a whole, does not make sense.

Allowable Subject Matter

5. Claims 1-3, 7 and 8 are allowed.

6. The following is a statement of reasons for the indication of allowable subject matter: No prior art has been found to disclose or suggest applicant's PWM correspondence table associating a PWM tone value to a corresponding laser pulse pattern, wherein said PWM tone value, when regarded as a bit sequence, comprises a first bit region having a value determined depending only on a difference value between an input tone value and a threshold value, and a second bit region having a value determined depending only on a value represented by said threshold value excluding four or five bits thereof, as recited in base claim 1.

At this time, no meaningful determination can be made as to the allowability of claims 4-6, 9 and 10, due to the indefiniteness of base claim 4, as mentioned above.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 4,783,837 (Kawamura et al.) discloses an image processing apparatus comprising first and second converter circuits.

U.S. Patent 5,553,200 (Accad) discloses a method and apparatus for providing bit-rate reduction and reconstruction of image data using dither arrays.

U.S. Patent 6,052,203 (Suzuki et al.) discloses a printing system with a RAM provided to convert gray-scale data of each pixel of image data into pulse-width data for each pixel.

U.S. Patent 6,191,868 (Shibuya et al.) discloses a distributed PWM halftoning unit and printer.

U.S. Patent 6,326,993 (Sato et al.) discloses a pulse width modulation system and image forming apparatus having the pulse width modulation system.

U.S. Patent 6,369,911 (Hattori) discloses an apparatus for generating pulse-width data for toner-transfer-type printing apparatus.

U.S. Patent 6,476,847 (Sato et al.) discloses a pulse width modulation system and image forming apparatus having the pulse width modulation system.

U.S. Patent 6,498,617 (Ishida et al.) discloses a pulse width modulation circuit, optical write unit, image forming apparatus and optical write method.

U.S. Patent 6,674,547 (Kadowaki) discloses an image processing apparatus for performing image formation using signals obtained by pulse-width modulating an image signal by a plurality of modulating methods.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas D. Lee whose telephone number is (703) 305-4870. The examiner can normally be reached on Monday-Friday (7:30-5:00), alternate Fridays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on (703) 308-7452. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thomas D. Lee
Primary Examiner
Art Unit 2624

tdl
April 30, 2004